

CLAIM SET AS AMENDED

1. (Currently Amended) A method for creating digital transport stream units, comprising the steps of:

(a) detecting program clock references contained in digital transport stream packets received from a set top box through a digital interface;

(b) creating a transport time reference for each of the transport stream packets based upon the detected program clock references and arrival times of the corresponding transport stream packets; and

(c) creating the transport stream units by adding each of the created transport time references to an associated one of the transport stream packets,

wherein said step (b) creates the transport time reference for an arbitrary one of the transport stream packets transmitted between two of the transport stream packets having program clock references by detecting the program clock reference value associated with each of two of the transport stream packets, and subtracting counter values from the detected program clock reference values,

wherein the counter values are arrival times of the two transport stream packets.

2. (Currently Amended) The method set forth in claim 1, wherein said step (b) creates the transport time reference for each of the transport stream packets based upon an error, defined as a difference between time differences of selectively inserted program clock references and an arrival time difference for each of the transport stream packets containing the program clock references,

wherein the program clock reference value and the error are stored in a temporary buffer, and the transport stream packets are stored sequentially in a second buffer.

3. (Currently Amended) The method set forth in claim 2, wherein said step (b) includes the steps of:

loading the program clock reference values from the temporary buffer into a compensation unit;

increases increasing or decreases decreasing the transport time reference by a time corresponding to said error; and

transmitting the program clock reference values from the compensation unit to a time stamper, the time stamper reading the one transport stream packet from the second buffer, and recording the received program clock reference value in a header of the one transport stream packet as a receiving time stamp, which will be used as a time reference for transmitting the one transport stream packet in playback.

4. (Currently Amended) The method set forth in claim 2, wherein said step (b) creates the transport time reference for an the arbitrary one of the transport stream packets received between the two ~~of the~~ transport stream packets having program clock references by compensating the arrival time of the arbitrary one of the transport stream packets by an amount corresponding to a linear proportion of the arrival time difference between the arbitrary one of the transport stream packets and a first one of said two transport stream

packets to the arrival time difference of said two transport stream packets.

5. (Previously Presented) The method set forth in claim 1, wherein said transport time reference is reference information upon which timing of transmission of the transport stream packets is based when the transport stream packets are transmitted to an external device after the transport stream packets are reproduced from a storage medium.

6. (Previously Presented) The method set forth in claim 1, further comprising a step of recording the created transport stream units on a rewritable recording medium having a digital data recording format.

7. (Currently Amended) A method for creating digital transport stream units, comprising the steps of:

(a) storing digital transport stream packets received from a set top box through a digital interface together with their arrival times temporarily;

(b) compensating the temporarily stored arrival time of each of the transport stream packets based upon a time difference of program clock references and an arrival time difference of the transport stream packets when more than two of the program clock references are detected from said received digital transport stream packets; and

(c) creating transport stream units by adding each of the compensated arrival times to associated ones of the transport stream packets as a transport time reference,

wherein said step (c) creates the transport time reference for an arbitrary one of the

transport stream packets transmitted between two of the transport stream packets having program clock references by detecting the program clock reference value associated with each of two of the transport stream packets, and subtracting counter values from the detected program clock reference values,

wherein the counter values are arrival times of the two transport stream packets.

8. (Currently Amended) A method for creating digital transport stream units, comprising the steps of:

(a) detecting program clock references from transport stream packets received from a set top box through a digital interface while storing the received digital transport stream packets together with their arrival times;

(b) detecting the stored arrival times of the transport stream packets containing the detected program clock references;

(c) comparing a difference of the two program clock references detected in said step (a) with an arrival time difference of the two transport stream packets detected in said step (b);

(d) compensating the stored arrival time of each of the transport stream packets based upon the comparison result; and

(e) creating transport stream units by adding the compensated arrival time to each of the transport stream packets as a transport time reference,

wherein said step (e) creates the transport time reference for an arbitrary one of the transport stream packets transmitted between two of the transport stream packets having program clock references by detecting the program clock reference value associated with

each of two of the transport stream packets, and subtracting counter values from the detected program clock reference values,

wherein the counter values are arrival times of the two transport stream packets.

9. (Currently Amended) An apparatus for recording digital transport streams, comprising:

a-means for detecting program clock references contained in digital transport stream packets received from a set top box through a digital interface;

a-means for comparing the detected program clock references with arrival times of the transport stream packets;

a-means for creating a transport time reference ~~for each of~~ for an arbitrary one of said transport stream packets ~~based upon the comparison result~~ transmitted between two of the transport stream packets having program clock references by detecting the program clock reference value associated with each of two of the transport stream packets, and subtracting counter values from the detected program clock reference values, the counter values being arrival times of the two transport stream packets; and

a-means for constructing transport stream units by adding the created transport time reference of each of the transport stream packets to ~~an associated~~ the arbitrary one of the transport stream packets.

10. (Currently Amended) An apparatus for recording digital transport streams, comprising:

~~a~~means for creating arrival times of digital transport stream packets received from a set top box through a digital interface;

~~a~~means for detecting program clock references contained in the received digital transport stream packets;

means for creating an transport time reference for an arbitrary one of the transport stream packets transmitted between two of the transport stream packets having program clock references by detecting the program clock reference value associated with each of two of the transport stream packets, and subtracting counter values from the detected program clock reference values, the counter values being arrival times of the two transport stream packets;

~~a~~means for comparing the detected program clock references with the created arrival times;

~~a~~means for compensating the created arrival times based upon the comparison result;
and

~~a~~means for constructing transport stream units by adding a compensated arrival time to ~~a corresponding the arbitrary one~~ of the transport stream packets as a the transport time reference.

11. (Previously Presented) The apparatus set forth in claim 10, wherein said compensating means compensates the created arrival times of the received digital transport stream packets so that differences between the detected program clock references are equal

to differences between the arrival times of the transport stream packets containing the detected program clock references.

12. (Currently Amended) An apparatus for recording digital transport streams, comprising:

a time information extractor for detecting program clock references contained in digital transport stream packets received from a set top box through a digital interface;

a subtracter for subtracting counter values from the detected program clock reference values associated with each of two of the transport stream packets, a first one preceding an arbitrary one of the transport stream packets and a second one following an arbitrary one of the transport stream packets, the counter values being arrival times of the two transport stream packets;

a time comparator for comparing the detected program clock references from said time information extractor with arrival times of the transport stream packets;

a transport time generator for creating a transport time reference for each of said transport stream packets based upon the comparison result from said time comparator; and

a data constructor for constructing transport stream units by adding the created transport time reference from said transport time generator of each of said transport stream packets to ~~an associated~~ the arbitrary one of the transport stream packets.

13. (Previously Presented) The apparatus set forth in claim 12, wherein said transport time generator creates the transport time reference for each of the transport stream packets

based upon an error, defined as a difference between time differences of the detected program clock references and the arrival time difference for each of the transport stream packets containing the program clock references.

14. (Previously Presented) The apparatus set forth in claim 13, wherein said transport time generator increases or decreases the transport time reference by a time proportional to said error.

15. (Currently Amended) The apparatus set forth in claim 13, wherein said transport time generator creates the transport time reference for ~~an~~ the arbitrary one of the transport stream packets received between two of the transport stream packets having the program clock references by compensating the arrival time of the arbitrary transport stream packet by an amount corresponding to a linear proportion of the arrival time difference between the arbitrary transport stream packet and a first transport stream packet of said two transport stream packets to the arrival time difference of said two transport stream packets.

16. (Currently Amended) An apparatus for recording digital transport streams, comprising:

a transport time generator for creating arrival times of digital transport stream packets received from a set top box through a digital interface;

a time information extractor for detecting program clock references contained in the received digital transport stream packets;

a subtracter for subtracting counter values from the detected program clock reference values associated with each of two of the transport stream packets, a first one preceding an arbitrary one of the transport stream packets and a second one following an arbitrary one of the transport stream packets, the counter values being arrival times of the two transport stream packets;

a time comparator for comparing the detected program clock references from said time information generator with the created arrival times from said transport time generator;

a time compensator for compensating the created arrival times from said transport time generator based upon the comparison result of said time comparator; and

a data constructor for constructing transport stream units by adding the compensated arrival times from said time compensator to the ~~corresponding arbitrary one of the~~ transport stream packets as a transport time reference.

17. (Previously Presented) The apparatus set forth in claim 16, wherein said time compensator compensates the created arrival time based upon an error, defined as a difference between time differences of the detected program clock references and the arrival time difference of each of the transport stream packets containing the program clock references.

18. (Previously Presented) The apparatus set forth in claim 17, wherein said time compensator increases or decreases the created arrival time by a time proportional to said error.

19. (Currently Amended) The apparatus set forth in claim 17, wherein said time compensator compensates the created arrival time of ~~an~~the arbitrary one of the transport stream packets received between two transport stream packets having the program clock references by an amount corresponding to a linear proportion of the arrival time difference between the arbitrary transport stream packet and a first transport stream packet of said two transport stream packets to the arrival time difference of said two transport stream packets.

20. (Previously Presented) The apparatus as set forth in claim 16, wherein a clock frequency of the digital interface is 24.576 Mhz., whereas a clock frequency for recording the digital transport streams is 27 Mhz.